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DYNAMICS EXPLORER TWIN SPACECRAFT UNDER EVALUATION TESTS

Two spacecraft that will ride piggy-back into orbit next July are currently undergoing rigorous prelaunch testing at the Goddard Space Flight Center, Greenbelt, Md.

Called Dynamics Explorer (DE) -A and -B, the twin satellites are scheduled to be stacked together and placed into coplanar polar orbits by a Delta 3913 launch vehicle from the Western Space and Missile Center, Lompoc, Calif., on July 31.

Their mission will be to explore the boundary region between Earth and space that affects the atmosphere, auroral displays, radio transmissions and perhaps climate and weather.

March 13, 1981

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Solar radiation and the solar wind have a dynamic impact on the near Earth environment, result of which affect the state of the atmosphere, ionosphere, magnetosphere and the more familiar phenomena -- weather, auroral displays and radio disturbances.

Prior spacecraft such as the Atmospheric Explorers have provided new information on solar radiation upon the lower thermosphere and upper atmosphere. The ISEE (International Sun-Earth Explorer) program has provided additional new information on interactions between the solar wind and the Earth's magnetic field; however, adequate knowledge does not exist regarding interactions between the two regions.

The Dynamic Explorer program is designed to supply such knowledge -- specifically, the strong interaction processes coupling the hot, tenuous, convecting plasmas of the magnetosphere and the cooler, denser plasmas and gases co-rotating in Earth's ionosphere, upper atmosphere and plasmasphere.

To accomplish this, the project will provide a central data processing and analysis system available so that each investigator on the science team can display geophysical data from all spacecraft instruments.

In their polar, coplanar orbits, one satellite (DE-B) will have a perigee sufficiently low (305 kilometers or 190 miles) for neutral composition, temperature and wind measurements.

Its apogee will be sufficiently high (1,300 km or 808 mi.) to provide a lifetime greater than one and one-half years and to allow measurements above the interactive regions for super-thermal ions and plasma flow measurements of the magnetospheric field lines.

The second spacecraft (DE-A) will be placed into a highly elliptical orbit having an apogee of 24,875 km (15,457 mi.) to allow for global auroral imaging, wave measurements in the middle of the magnetosphere and crossings of auroral field lines at several Earth radii.

The DE-B (low mission) has six 3-centimeter (1.2-inch) diameter flexible stem antennas 10 meters (33 feet) long, and a single rigid boom 6 m (20 ft.) long. These external antennas will collect data for the scientific instruments on board.

The solar cell arrays mounted on the 136-cm (53.5-in.) diameter spacecraft body will supply the satellite with electrical energy which can be delivered directly to the scientific instruments or stored in nickel-cadmium batteries as required.

DE-A is spin stabilized; its pitch, or spin axis having a spin rate of 10 rpm while the DE-B spacecraft is three axis stabilized with its pitch axis controlled to continually point towards the Earth's surface. Configurations of both spacecraft are designed to minimize unbalancing torques created by atmospheric drag encountered in space.

Tracking, command, realtime and recorded data will be provided by NASA's Space Tracking and Data Network; the NASA Worldwide Communications System, NASCOM; and the DE Operations Control Center at Goddard.

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